

Stat 218 - Day 1 Variables

Key Definitions

- **Observational Units**- the objects described by a set of data (people, animals, things)
- **Variable**- any characteristic of an individual (can take different values for different individuals). A variable is *quantitative* if it takes on numerical values on which it makes sense to perform arithmetic operations; a variable is *categorical* if it consists of category designations.

Example 1: Suppose that I ask each of you to report:

- height
- time spent sleeping last night
- whether or not you went to sleep before midnight last night
- month of birth
- distance from home
- whether or not you have a cellular phone
- the number of letters in your last name

(a) Who/what are the observational units here?

(b) How many variables are here?

(c) Which variables are quantitative; which are categorical?

Example 2:

(a) If I report the average height of a person in this class, is that a variable? Explain.

(b) If I record the percentage of students in this class who have a cellular phone, is that a variable? Explain.

Summaries are not variables.

(c) If I record the above information for every class taught at Cal Poly this quarter, would they be variables? What would the observational units be in that case? Explain.

Example 3: Suppose that the observational units of interest are the fifty states. Identify which of the following are variables and which are not:

- (a) the gender of the state's governor
- (b) the number of states that have a female governor
- (c) the percentage of the state's residents over 65 years of age
- (d) the highest speed limit in the state
- (e) whether or not the state's name contains one word
- (f) the average income of an adult resident of the state
- (g) the number of births per 1000 residents of the state in 2004
- (h) how many states were settled before 1865

Example 4:

- (a) Take all films that have won the Academy Award as Best Picture to be the observational units in a study. Identify three variables that can be recorded on these individuals. (Be sure to state them clearly as variables.)

- (b) Repeat, using all Super Bowl games that have been played as the observational units.

Example 5: Class Data

We will count the responses of students in this class to these questions:

- (a) Are you male or female?

Male	Female

- (b) If a time machine were available, and you could travel in time (but not change any events), would you choose to go to the past or the future?

Past	Future

- (c) On what day of the week were you born?

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

[Hint: To find out, log onto the computer and go to www.timeanddate.com/. Look under "calendar generator," click on "other year..." and enter your year of birth.]

- (d) What types of variables are these?